Journal of Multidisciplinary Healthcare

Dovepress
Taylor & Francis Group

Open Access Full Text Article

ORIGINAL RESEARCH

Influencing Factors of Dietary Guidance Compliance in Patients with Esophageal Cancer During Preoperative Neoadjuvant Therapy: A Qualitative Study

Ai-Ying Sun[1,*], Fu-Na Yang[2,*], Xiao-Xia Xu[2], Wei Wang[1], Ying-Ying Wang[1], Rui-Chen Ma[1]

[1]Department of Thoracic Surgery, The Affiliated Cancer Hospital of Zhengzhou University and Henan Cancer Hospital, Zhengzhou, Henan Province, People's Republic of China; [2]Department of Nursing, The Affiliated Cancer Hospital of Zhengzhou University and Henan Cancer Hospital, Zhengzhou, Henan Province, People's Republic of China

*These authors contributed equally to this work

Correspondence: Rui-Chen Ma, Department of Thoracic Surgery, The Affiliated Cancer Hospital of Zhengzhou University and Henan Cancer Hospital, No. 127 Dongming Road, Zhengzhou, Henan Province, 450008, People's Republic of China, Tel +86 13633792691, Email 1003373360@qq.com

Purpose: To explore the factors influencing dietary guidance adherence in esophageal cancer patients receiving neoadjuvant therapy and to understand their decision-making process through the theoretical lens of the health belief model (HBM).

Methods: A descriptive qualitative study was conducted via in depth, semistructured interviews. A purposive sample of 15 esophageal cancer patients receiving preoperative neoadjuvant therapy was recruited until data saturation was achieved. The data were analyzed via directed content analysis, guided by the core constructs of the HBM.

Results: Six categories and fifteen subcategories were identified: perceived susceptibility (intuitive perception of body signals, risk awareness via medical information); perceived severity (insufficient threat recognition, awareness of malnutrition-related harm); perceived benefits (improving physical condition, promoting disease recovery); perceived barriers (treatment-related side effects, economic burden, psychological distress, conflicts in dietary habits); self-efficacy (empowerment strategies of highly efficacious individuals, the helplessness of those with low efficacy); and cues to action (professional nutritional education, family supervision and support, peer support).

Conclusion: This study suggests that clinical medical workers should fully recognize the impact of personal health beliefs on dietary behavior compliance. This study provides a robust, theory-driven evidence base for developing targeted, multicomponent nutritional interventions that are fundamentally patient-centered, with the ultimate goal of improving treatment tolerance, surgical outcomes, and overall survival.

Keywords: esophageal cancer, dietary guidance, adherence, qualitative research

Introduction

Esophageal cancer is a highly aggressive malignancy with a formidable global health burden, and the morbidity and mortality of esophageal cancer patients in China are the highest in the world.[1] Most patients with esophageal cancer seek medical treatment because of progressive dysphagia. When they are diagnosed, they are in the middle and late stages of the disease, and the incidence of malnutrition is as high as 60%-85%.[2] For stage II and III esophageal cancer, preoperative neoadjuvant treatment, primarily consisting of concurrent chemotherapy, immunotherapy and radiotherapy, has been established as the standard of care prior to curative-intent surgery.[3] This comprehensive treatment strategy significantly improves pathological response rates and overall survival. However, preoperative chemotherapy/radiotherapy is also a double-edged sword that is

https://doi.org/10.2147/JMDH.S596002
Received: 13 January 2026
Accepted: 2 April 2026
Published: 22 April 2026

related to nausea, vomiting, radiation esophagitis and other symptoms (such as reduced taste acuity and xerostomia), which further affect the intake of nutrients and have a negative effect on patients' nutritional status, therapeutic effect, and prognosis.[4]

Maintaining adequate nutritional status during preoperative neoadjuvant treatment is paramount. Robust nutritional support is directly correlated with enhanced treatment tolerance, reduced incidences of severe adverse events, lower postoperative complication rates (for example, anastomotic fistula, infection), and improved overall quality of life.[5,6] Therefore, active nutritional therapy is highly important for the treatment and prognosis of patients with esophageal cancer and has become an indispensable part of comprehensive cancer treatment.[7,8] To improve the nutritional status of these patients, dietary guidance is considered one of the most economical and effective methods.[9] Its main purpose is to improve dietary compliance by helping patients understand the importance of a designated diet and nutritional needs. Consequently, trusted nutrition advice and information, typically delivered by nutritionists or nutrition nurses upon hospital admission, aims to equip patients with the knowledge and strategies to navigate the complex dietary challenges posed by their treatment, such as dysphagia, nausea, taste alterations, and early satiety.

Although medical staff generally realize the importance of preoperative nutritional status and implement dietary guidance and recommendations, a major clinical problem still exists; that is, patients' actual compliance with dietary guidance is often ignored. In clinical practice, patients' compliance with the suggested diet plan is often poor and varies greatly.[10,11] Studies have shown that more than 20% of cancer patients' dietary compliance becomes worse after chemotherapy/radiotherapy, which leads to the deterioration of tumor-related malnutrition, which not only reduces the treatment effect and quality of life of patients but also increases their medical expenses and mortality.[12,13] Dietary compliance is an essential prerequisite for effective nutritional interventions. Dietary adherence may be influenced by a complex, multifaceted interplay of factors that extend beyond simple comprehension.[14,15] At present, the understanding of these factors, especially deep-rooted perceptions and cognitive determinants from the patient's perspective, is still limited and needs in-depth exploration.

Health belief is very important for patients to cultivate and maintain health behavior.[16] The health belief model (HBM) is one of the most commonly used models for understanding people's medical compliance behavior and mainly includes six elements: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy.[17] This model focuses on the psychological changes of patients and suggests that if patients have beliefs related to health and disease and take the initiative to change risky behaviors, engaging in behaviors that are beneficial to disease health is guaranteed to achieve disease improvement. Some reviews and meta-analyses have confirmed the effectiveness of the HBM in predicting health behavior.[18,19] As cancer has the highest incidence of malnutrition, at present, many quantitative studies have been carried out on the nutritional management of esophageal cancer patients.[20] However, there are few qualitative studies on the dietary compliance of patients with esophageal cancer worldwide. Compared with quantitative research, qualitative research can better understand the real thoughts and feelings of patients and thus better analyze the specific influencing factors that affect compliance with dietary guidance for patients with esophageal cancer during preoperative neoadjuvant chemo-/radiotherapy.

Addressing dietary adherence is inherently a multidisciplinary challenge that extends beyond the scope of clinical nutrition alone. It requires the integrated efforts of surgeons, nurses, dietitians, psychologists, and social workers to effectively manage the complex interplay of physical symptoms, psychological distress, social support, and cultural beliefs that shape a patient's eating behavior during treatment. Therefore, this study intends to analyze the influencing factors of dietary guidance compliance in esophageal cancer patients during neoadjuvant therapy from six aspects through descriptive research, taking the HBM as the theoretical framework to further guide and intervene in dietary management, effectively improve dietary compliance, and improve the feasibility, safety and final curative effect of follow-up surgery.

Materials and Methods

Design

This descriptive qualitative study used face-to-face semistructured in-depth interviews. The reporting of this study adhered to the Consolidated Criteria for Reporting Qualitative Studies (COREQ) checklist.[21]

Participants and Setting

This study enrolled participants from the Thoracic Surgery Department of a large tertiary cancer hospital in central China between August and October 2025. This hospital, the leading cancer center in Henan Province, has a capacity of 3000 inpatient beds. During their initial consultation, potentially eligible patients were briefed on the study's aims and procedure. Those who expressed interest were subsequently invited to enroll. The inclusion criteria were patients (1) ≥18 years of age; (2) had a confirmed diagnosis of esophageal cancer; (3) received preoperative neoadjuvant chemotherapy and/or radiotherapy for more than one cycle; (4) had basic reading and comprehension skills; and (6) were able to provide written informed consent. Potential subjects were excluded if they (1) had a diagnosis of any other cancer or (2) were unaware of their own disease. A purposive sampling strategy was employed to recruit participants and gather data, ensuring the inclusion of diverse perspectives across variables such as sex, age, cancer stage, educational background, and marital status. The sample size was determined by the saturation principle, which refers to the absence of new information from interviews.[22]

Data Collection

A research team comprising two masters of nursing students, two clinical nurse specialists in nutrition, one professional nutritionist, and two nursing administrators, was assembled for this study. This multidisciplinary composition ensured a broad spectrum of expertise in both clinical care and nutriology. The initial interview guide was developed on the basis of the HBM and was informed by a comprehensive literature review and consultations with experts. The initial interview guideline was partially revised to form a formal interview guideline after pilot interviews with two patients (Figure 1). All one-on-one,

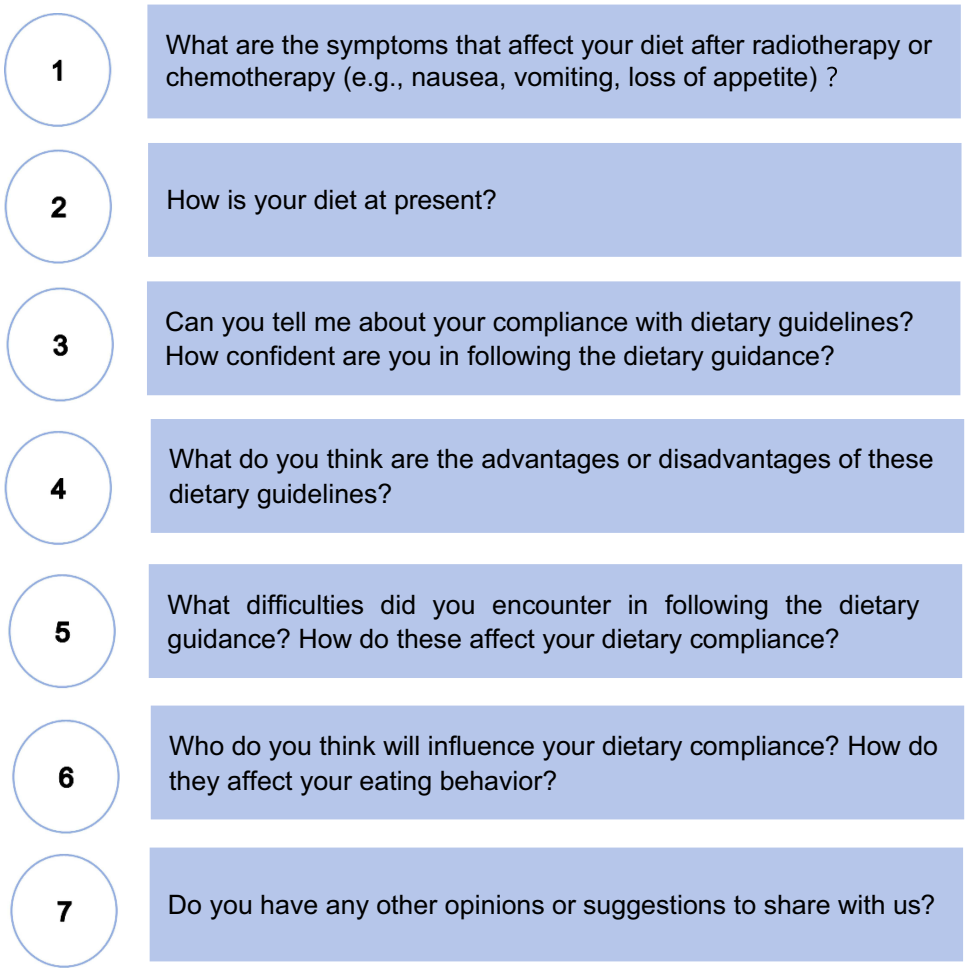

Figure 1 Semistructured interview guide used to explore patients' dietary experiences.

semistructured interviews were conducted by the first author, a female scholar with extensive experience in qualitative research. The interviews took place in a private conference room within the hospital to ensure confidentiality and minimize interruptions. Prior to the formal interview, the researcher dedicated time to building rapport with each participant. Notably, the interviewer was not involved in the direct clinical care of the participants, which helped foster a relaxed atmosphere. Throughout the interviewing procedure, the interviewer maintained a neutral attitude, carefully avoiding leading questions or suggestive statements.

An audio recording device was used to record the entirety of each interview. Throughout the interview process, the sequence and content were flexibly adjusted on the basis of the participants' responses, keeping relevance to the topic. The researcher also recorded nonverbal expressions, such as facial expressions and body language. All communication was conducted in Mandarin, with participants confirming that there were no language barriers. The interviews lasted between 30 and 50 minutes on average. At the end of each interview, the researcher provided a brief summary of the discussion and invited the participants to offer clarifications or additional comments to enhance the robustness of the data. After each interview, an interview memo was promptly completed, aiming to clearly document methodological decisions and potential biases during the study. No repeated interviews were conducted.

Ethical Considerations

Ethical approval for this study was granted by the hospital's ethics committee in accordance with the principles of the Declaration of Helsinki (2022–345). Prior to the interviews, all the participants received a detailed explanation of the study's purpose and significance and provided written informed consent. They were also informed that they could withdraw from the study at any time without any consequence to their care. To ensure confidentiality, all audio recordings were securely deleted after transcription.

Data Analysis

The analysis was conducted manually without the use of any software package. This approach was chosen to allow us to extend the theoretical propositions of the HBM while remaining open to emergent findings. A directed content analysis approach was used to code the textual data, following a structured five-phase procedure.[23] (1) Immersion: Two researchers independently read and re-read the transcripts to gain a holistic sense of the data. (2) Initial coding using the HBM: A preliminary coding framework was developed based on the six core constructs of the HBM. The researchers then independently coded all transcripts, deductively assigning segments of text that corresponded to these predefined categories. (3) Identifying emergent categories (inductive coding): Crucially, to prevent the HBM from overly constraining our analysis, we actively sought and coded data that were relevant to the research question but did not fit neatly into the existing HBM constructs. These data segments were set aside and later analyzed inductively to identify new, emergent subcategories or categories. (4) Categories refinement and framework adjustment: Through iterative discussions within the research team, the initial deductive codes and the emergent inductive codes were compared, contrasted, and synthesized. This constant comparative process allowed us to refine the subcategories, adjust the coding framework dynamically, and ensure that the final thematic structure was both grounded in the HBM and truly representative of the participants' voices. Any discrepancies in coding or interpretation were resolved through team discussions until a consensus was reached. (5) Synthesizing and interpreting: we established clear relationships between the coded text and the final categories/subcategories, selecting the most illustrative participant quotations to support our interpretations.

Quality Control

The rigor of the qualitative study was assured via credibility, dependability, confirmability, and transferability.[24] Credibility was achieved by utilizing an interview guide developed from a thorough literature review and administered by an experienced qualitative interviewer. Furthermore, credibility was strengthened by incorporating direct participant quotations in the results, and findings were shared with participants for feedback. To enhance dependability and confirmability, all interviews were conducted by a researcher, and the data were independently analyzed and coded by two researchers. Any disagreements in the analysis were resolved through group discussion. Transferability was supported by providing a detailed description of the research methodology, including data collection and analysis processes, enabling others to judge the relevance of findings to

different contexts. Moreover, a self-reflective attitude was upheld by the research team to minimize subjective bias and to ensure that the analysis remained grounded in and truly representative of the participants' own perspectives and feelings.

Results

Finally, saturation was reached for 15 patients because no new information appeared. Patients were coded as P1–P15, and more detailed characteristics of the participants are shown in Table 1. Six categories and 15 corresponding subcategories were identified, which collectively illustrate the multifaceted factors influencing adherence to dietary guidance. The structure is organized around the core constructs of the HBM (Table 2).

Category 1: Perceived Susceptibility

Intuitive Perception of Body Signals

Patients realized that they were at nutritional risk through direct and visible signals from their bodies. When patients interpret "malnutrition" through physical changes in their daily lives, the abstract medical concept is transformed into a genuine physical experience.

> Look at my belt; it has shrunk several buttonholes. These trousers keep slipping down when I wear them. It is as if they were not mine. I know that I have lost a lot of weight recently. (P1)

> When I wash my face, I touch it, and there is no meat on my face. When I look in the mirror, I can hardly recognize myself. I suspect it is because I did not eat well. (P12)

Risk Awareness via Medical Information

Patients construct their nutritional risk perceptions through objective information and professional warnings provided by external medical systems. Compared with the immediacy of body signals, this cognition may be more forward-looking and rational. However, its effect depends on the clarity of information, the intensity of communication and the trust of patients in medical authority.

> The nurses asked me to weigh myself every week, and they always emphasized the importance of diet and nutrition. (P11)

> The nutritionist came to talk to me specifically, saying that at this stage, whether my nutrition is adequate or not makes an enormous difference in the subsequent treatment effect and recovery. (P10)

Category 2: Perceived Severity

Insufficient Threat Recognition

Owing to the lack of relevant knowledge, some patients are often unaware of the danger to the treatment and rehabilitation of diseases when they are malnourished, which leads to poor dietary compliance. Patients tend to underestimate their nutritional risk and believe that they will not have nutritional problems or that the problems are not so serious.

> I think what you said is too serious. I just have no appetite these days, and I do not want to eat. I will eat more when I get better in a few days. How can I be so easily malnourished? (P4)

> I used to be in good health, and I do not think there was any problem with my nutrition. In addition, the most important thing is still medicine and surgery. Nutrition and exercise are just supplementary. (P14)

Awareness of Malnutrition-Related Harm

Some patients with esophageal cancer agree that noncompliance with dietary guidance may have adverse consequences for their health and disease treatment. The most direct and strongest concern of patients is that nutritional problems interrupt or delay their core anticancer treatment. Second, patients feel the weakness and fatigue caused by malnutrition from personal experience.

Table 1 Characteristic of Participants

Participant Code	Gender	Age (Years)	Cancer Stage	Marital Status	Employment Status	Neoadjuvant Treatment	Nutritional Risk Score (NRS 2002)	Time to Medical Consultation	Comorbidity
1	Male	43	T3N1M0	Married	Employed	CT	3	3 months	None
2	Male	55	T3N0M02	Married	Employed	CT	1	10 days	None
3	Female	64	T0N0M02	Married	Unemployed	CT	3	2 months	Cerebral Infarction
4	Female	62	T0N0M0	Married	Retired	CT	1	2 weeks	None
5	Female	68	T3N0M02	Married	Unemployed	CT	3	20 days	Hypertension, Cerebral Infarction
6	Male	59	T3N0M0	Married	Employed	CT+RT	1	2 weeks	Hypertension
7	Male	60	T0N0M0	Married	Employed	CT	1	20 days	None
8	Female	67	T0N0M02	Married	Unemployed	CT+RT	1	1 month	None
9	Female	72	T0N0M02	Married	Unemployed	CT+RT	0	3 months	Coronary heart disease
10	Male	69	T3N0M0	Married	Unemployed	CT	3	1 month	Coronary heart disease
11	Male	73	T2N0M02	Married	Unemployed	CT	3	2 weeks	Hypertension
12	Female	77	T3N1M0	Married	Unemployed	CT	2	3 months	Hypertension
13	Female	65	T0N0M0	Married	Unemployed	CT+RT	0	2 months	Hypertension, Diabetes mellitus
14	Male	65	T0N0M02	Widowed	Unemployed	CT+RT	1	2 months	Hypertension
15	Female	79	T0N0M0	Widowed	Unemployed	CT+RT	1	3 months	Coronary heart disease

Abbreviations: CT, Chemotherapy; RT, Radiotherapy.

https://doi.org/10.2147/JMDH.S596002

Table 2 Overview of the Categories and Subcategories

Categories	Subcategories
Perceived susceptibility	Intuitive perception of body signals
	Risk awareness via medical information
Perceived severity	Insufficient threat recognition
	Awareness of malnutrition-related harm
Perceived benefits	Improving physical condition
	Promoting disease recovery
Perceived barriers	Treatment-related side effects
	Economic burden
	Psychological distress
	Conflicts in dietary habits
Self-efficacy	Empowerment strategies of highly efficacious individuals
	The helplessness of those with low efficacy
Cues to action	Professional nutritional education
	Family supervision and support
	Peer support

There was a man in the same ward who stopped chemotherapy for a week because of his weakness and low white blood cells. I cannot be like him. (P2)

I was only halfway through my radiotherapy when the doctor told me that my physical condition was deteriorating too rapidly and asked if I could hold on. If I gave up halfway, all the money would be wasted, and all the suffering would be in vain. I must eat well from now on and have more nutritious food. (P6)

I feel so weak that I have to lean against the wall and rest for a while when I walk from the bedside to the toilet. I know that if I do not eat something nutritious, my condition will get worse and worse. (P8)

Category 3: Perceived Benefits

Improving Physical Condition

Esophageal cancer patients may experience a series of symptoms of discomfort due to multiple factors, such as tumor consumption, organ and tissue atrophy, and treatment. Some patients say that the dietary guidance provided by medical staff helps them control their weight and various physiological indices, improve their physical function and improve their quality of life.

I have found that as long as I force myself to eat more every day, my spirit will be much better that day. If I throw up, take a break and then eat again, it is fine. Otherwise, with an empty stomach, I can only lie in bed, feeling dizzy and disoriented. (P3)

When I can eat something, I feel much better and do not consider myself a patient anymore. During this period, I gained 1 kilogram, and the test results this time were better than last time. I'm very happy. (P5)

Promoting Disease Recovery

Some patients regard food as the essential energy and material basis to support them throughout the entire cancer treatment process. They consider maintaining their nutritional status a mandatory prerequisite and an imperative "task" for obtaining the opportunity for a final curative surgery.

I will force myself to eat as the doctor suggests. Good nutrition is the ticket for surgery. I weigh myself every day. (P11)

Only after I have eaten well will the doctor dare to operate on me, and the success rate of the operation will also be higher. No matter how uncomfortable I feel, I must keep eating in order to recover smoothly. (P6)

Category 4: Perceived Barriers

Treatment-Related Side Effects

The vast majority of patients mentioned that after chemotherapy/radiotherapy, they experienced symptoms such as decreased appetite, nausea, vomiting, heartburn, and altered taste, which affected their ability to eat. These symptoms made it difficult for them to follow the dietary advice given by medical staff.

> For several days after each chemotherapy session, I had no appetite and did not feel like eating. After a while when my body got a little better and I could eat a bit, it was time to come back to the hospital for another round of chemotherapy. (P7)

> I have remembered all your dietary suggestions, but since I started the treatment, my appetite has decreased even more. I feel full after eating just a little. In addition, I always have a strange taste in my mouth. (P9)

Economic Burden

A few patients indicated that their illness exacerbated the financial burden on their already poor families, making it difficult for them to follow the dietary guidance provided by medical staff.

> That nutritional supplement costs a lot per box. The doctor said to take it every day. It is like drinking money. The surgery fee is also very expensive. Our family truly cannot afford it. (P13)

> After I got sick, I stopped going out to work, and there was no other income at home. It would be very difficult for me to follow the nurse's advice and have a balanced diet with meat, eggs, milk, vegetables, and fruits every day. (P15)

Psychological Distress

Some patients may experience significant psychological stress, such as anxiety, depression and despondency. Moreover, they expressed that their illness has become a burden to their families, so they tend to be accommodating in their food choices, and it is difficult for them to adhere to the dietary guidance provided by medical staff.

> Just being alive is enough. I will eat whatever I want and skip what I do not. I do not want to worry so much about food. (P4)

> Every time I come to the hospital, my family members come to accompany me. The whole family revolves around me. I know I have caused them a lot of trouble, so I usually eat whatever they prepare. Seeing my family so tired, I feel so sorry for them. (P5)

Conflicts in Dietary Habits

Eating habits are deeply rooted in a person's culture, family, emotions and daily life, so when the advice of medical staff conflicts with these deep-rooted habits, patients experience complex struggles. In addition to eating habits affecting patients' eating behavior, traditional Chinese dietary concepts also have an impact on patients.

> I love to drink porridge, but now the nurse says not to drink it, which is easy to raise blood sugar. She asked me to drink milk and vegetables instead. I'm not used to drinking these. (P10)

> I do not eat fruits, although they are rich in vitamins. In Chinese medicine, fruits are cold food and are not good for health. (P8)

Category 5: Self-Efficacy

Empowerment Strategies of Highly Efficacious Individuals

Some patients with high self-efficacy realize the importance of reasonable nutritional supplementation for their own health and disease recovery and urge them to form long-term adherence to dietary guidance. Despite these difficulties, patients believe that they have the means and ability to deal with them and will take various strategies to ensure nutritional intake.

> I have set a strict eating schedule for myself, which I adhere to without fail. Even if I'm not hungry, I still have to eat a few bites when it is time. I believe that eating is more effective than taking medicine. (P2)

I find that eating cold food is more comfortable than hot food. Therefore, I asked my family to chill the nutrient solution so that I could drink it slowly. There are always more solutions than problems. One has to figure out what suits them best on their own. (P3)

The Helplessness of Those with Low Efficacy

Some patients, due to concerns about disease progression, increased stigma, and other reasons, believe that they lack the ability to change their current situation. Therefore, it is somewhat difficult for them to follow dietary guidance and form dietary habits.

This is not something that can be solved by "willpower". You cannot understand that discomfort. I have tried so many times, and I remember what the doctor said, but I truly did my best. (P7)

Every attempt is a blow. Now when I see a bowl and a spoon, I feel scared and resistant from the bottom of my heart. (P9)

Category 6: Cues to Action

Professional Nutritional Education

Patients hope to learn more about dietary knowledge from healthcare professionals, and they will take the initiative to obtain relevant dietary knowledge through multiple channels, including traditional media such as TV and books, as well as emerging media such as short videos and public account platforms.

When I was in the hospital, the nurse told me a lot about diet, such as high-protein foods, foods to prevent constipation and antioxidant foods. Doctors and nurses should talk more about these, and we are willing to listen too, because we truly know too little about this. (P5)

When I have nothing to do at home, I will watch some short videos about nutritious diets made by experts on my mobile phone. (P8)

Family Supervision and Support

The ability of family caregivers to fully exert their social support can help patients actively cope with adverse reactions caused by treatment. Most patients mentioned that their family members oppose their noncompliant dietary behaviors. After they perceive support and supervision from their family members, they enhance their dietary compliance.

My wife, in order to ensure I get proper nutrition, keeps changing up the dishes she cooks for me. Seeing how devote she is, I force myself to eat. (P1)

I like to have pickled radish as a side dish when I eat. My daughter now does not allow me to eat these pickled foods, saying they are bad for my health. Now she always looks up some information on the internet by himself and then cooks nutritious meals for me. (P11)

Peer Support

Peer support refers mainly to support among patients who have experienced the same or similar diseases and treatment processes. In patients, deep emotional resonance can be formed without much explanation. Peer support is an important source of positive energy that promotes patients' compliance with diet and adherence to treatment.

There is a patient in my village who is just like me. He eats very nutritiously every day and looks energetic. He told me that I must eat more and exercise more to enhance my immunity. (P1)

Last time I met a patient, he just attached great importance to diet and went running in the park during the intermission of treatment. I want to learn more from him. (P10)

Discussion

In the theory of the HBM, perceived susceptibility and perceived severity are usually attributed to perceived threats.[25] This study revealed that some patients tend to underestimate the severity of the problem because of a lack of relevant knowledge and regard malnutrition as a temporary and reversible "appetite problem" or believe that its importance is far lower than that of drugs and surgery, which is an obstacle to patients' dietary compliance. Previous studies have shown that the nutritional knowledge of cancer patients is low and that the nutritional knowledge literacy level of patients is related to sociodemographic factors such as education level, sex, age, and economic status.[26] Patients with higher education levels or younger patients can learn disease-related knowledge more actively, obtain medical information in more diverse ways, understand the development and prognosis of the disease more comprehensively, and have higher compliance with treatment. Healthcare workers should provide personalized nutrition education and dietary guidance to patients through diverse channels, such as online and offline, on the basis of their different sociodemographic backgrounds. In contrast, some patients can perceive nutritional risks through their own body signals and external medical information. Research has shown that the greater an individual's perception of health threats is, the greater the possibility that they will adopt positive health behaviors.[27] Healthcare providers should increase patients' susceptibility to nutritional risks through specific cases and promote their timely and effective implementation of dietary management. Many patients in this study perceived that the harm caused by malnutrition was related to two consequences: one was the direct interruption of the anticancer treatment process, and the other was the decline in their own physical functions. Given that intuitive body signals are the most primitive driving force for behavior change, personalized nutrition support strategies should not only provide online dietary guidance and other services with the help of smartphone applications based on digital health but also utilize decision-making aids to directly link the treatment goals that patients are most concerned about with their most immediate physical sensations.

This study clearly indicates that the perceived barriers faced by esophageal cancer patients following dietary guidance are complex and multifaceted, revealing why some patients recognize the importance of nutrition but find it difficult to adhere to dietary guidance. Research has shown that cancer patients often suffer from various problems, such as loss of appetite, nausea and vomiting, and changes in taste during chemotherapy.[28] In the interviews, the vast majority of patients also believed that the above symptoms were the greatest obstacles affecting their interest in eating and compliance with diet. Healthcare professionals should use professional appetite assessment tools to quantitatively evaluate patients' appetite, promptly identify problems and implement relevant interventions.[29,30] For patients with a reduced appetite, commonly used appetite-stimulating drugs are often prescribed. Moreover, alternative Chinese therapies such as moxibustion, acupoint application, decoctions, or nonpharmacological interventions such as psychological therapy can be combined for treatment.[31] In addition, frequently changing the types of food, the combination of dishes and cooking methods, to enhance the stimulation of vision, smell and taste, increase patients' interest in eating and improve their compliance with diet, is also recommended. The economic burden is also a realistic issue. In the interviews, some patients lost confidence in following dietary guidance because of the relatively high cost of treatment. It is necessary to expand the reimbursement scope of basic medical insurance and increase the reimbursement rate to reduce the medical expenses of patients and their families. Clinical intervention must incorporate economic assessment into routine nutrition screening and actively link social resources, such as charitable aid projects. Otherwise, any refined nutrition plan would be nothing but a castle in the air for patients mired in economic hardship.

Moreover, patients' dietary concepts largely influence their dietary behaviors. When scientific nutritional advice conflicts with patients' deeply rooted cultural dietary habits and traditional beliefs, patients may find it hard to accept.[32] In traditional Chinese medicine, overeating heaty food ("Shang huo" in Chinese) and "Fa wu" (meaning nourishing and stimulating food) are bad for patients. These findings suggest that medical staff need to pay attention to patients' preferences and cultural context when providing nutritional care guidance. Finally, this study revealed that some patients have relatively serious psychological problems. Patients' anxiety, fear or guilt caused by worrying that their illness would become a burden to the family leads to low self-efficacy; thus, they give up compliance with dietary guidance. Good self-efficacy is the intrinsic motivation for patients to adhere to dietary guidance.[33] Patients with high self-efficacy become active leaders in their own health management, proactively exploring methods that suit them. However, patients with low self-efficacy develop fear and resistance toward eating after repeated failures. When providing dietary guidance, medical staff should pay attention to the psychological burden and self-efficacy of patients. They can encourage patients to express themselves and regulate their emotions by

organizing expressive writing interventions or supportive-expressive discussion groups.[34] Individuals with low self-efficacy can also rebuild their confidence and ability to overcome difficulties by setting small, achievable goals, through methods such as mindfulness-based stress reduction, and by constantly summarizing successful experiences that suit them.[35,36]

This study revealed that in terms of perceived benefits, patients' understanding of the benefits that following dietary guidance can bring constitutes the driving force for them to overcome their eating disorders. Parwati et al noted that only when individuals fully recognize the positive outcomes associated with healthy behaviors are they more likely to adhere to health management behaviors.[37] When patients associate their diet with improved mental state and reduced fatigue, this intuitive physical perception can motivate their compliance with dietary regimens. Second, some patients link their nutritional status with the success rate of surgery and the long-term survival rate. The benefits of nutrition for disease recovery can help them overcome eating disorders better. In clinical practice, healthcare providers should not only consciously help patients identify and record the short-term positive changes caused by nutritional behaviors but also emphasize the long-term benefits of nutrition, thereby establishing a continuous and multilevel positive feedback loop. Notably, in China, clinical nutrition work is still in a stage of gradual development.[38] This may be related to the lack of unified and standardized dietary guidance, which leads to contradictory and unclear dietary advice being provided to patients. Medical staff and clinical nutritionists are the main sources for patients to obtain nutrition education and dietary guidance. Medical staff should first increase their own reserves of nutrition knowledge, intensify educational efforts, and diversify educational forms to help patients develop good and healthy dietary habits.[39] The development of visual dietary guidance tools to increase the intuitiveness and operability of the guidance is recommended.

It is well known that social support strongly influences patients' dietary concepts and habits.[40] Preoperative neoadjuvant therapy for patients with esophageal cancer is a long-term process that requires the full mobilization of multidimensional social support systems to encourage patients to improve their dietary compliance. In terms of family support, patients have the most contact with their family members. Family members need to not only guide and encourage patients mentally but also supervise and urge them in terms of diet, playing a positive motivating role. Research shows that family-oriented psychosocial interventions are more effective for patients' physical and mental health than patient-centered interventions or routine care.[41] Therefore, medical staff should also attach importance to providing nutritional education to the families of patients, increasing their knowledge reserves. Moreover, encouraging the exchange of successful experiences among patients is particularly important. Peer support, as a unique form of social support, plays an irreplaceable role in which neither medical staff nor family members can match.[42] Because of their shared or similar experiences with illness, fellow patients offer unparalleled empathy and credibility. The communication among patients can enhance their self-efficacy. However, medical staff should pay attention to the accuracy of such information and promptly correct any cognitive misunderstandings that patients may have.

The findings of this study underscore the necessity of a multidisciplinary approach to improving dietary adherence. For oncologists and surgeons, the results highlight the need to move beyond simply prescribing nutrition, and instead, explicitly communicate the link between nutritional status and tangible treatment outcomes (eg., avoiding treatment delays, ensuring surgical candidacy) to enhance patients' perceived threat and benefits. Nurses and dietitians, who are at the frontline of patient education, should adopt a dual strategy: providing clear, professional guidance while also assessing and addressing patients' cultural beliefs and psychological barriers. They can facilitate "cues to action" by involving family caregivers in education sessions and by connecting patients with suitable peer support. Furthermore, the significant role of psychological distress and self-efficacy calls for the early integration of psychologists or psychiatric liaison nurses into the nutrition care team. Interventions such as mindfulness or setting small, achievable goals can be powerful tools for rebuilding a patient's sense of mastery over their eating. Finally, social workers have a crucial role in identifying patients facing financial toxicity and linking them with social resources or charitable aid, thereby mitigating a major "perceived barrier." By working synergistically, this multidisciplinary team can address the full spectrum of factors—from the physiological to the psychological and social—that determine a patient's ability to adhere to dietary guidance.

Limitations

Despite these insightful findings, this study has several limitations that should be considered when the results are interpreted. First, the qualitative descriptive design and relatively small sample size of 15 participants, all of whom were recruited from a single clinical center, may limit the generalizability of the findings. Future research could use a multicenter design to increase

the diversity and representativeness of the participants. Second, the data relied exclusively on patient self-reports. While this is the primary method for capturing subjective perceptions, it is susceptible to recall bias and social desirability bias. Although we took steps to minimize this by assuring confidentiality and emphasizing the value of honest responses, we acknowledge that participants may have still over-reported their adherence to "please" the medical establishment. Triangulating interview data with objective measures such as weight records or food diaries in future studies could provide a more comprehensive and profound understanding. Finally, this study focused specifically on the patient perspective and did not incorporate the viewpoints of their family caregivers or healthcare providers. Multistakeholder qualitative research can be conducted in the future, which will help to reveal the complex interpersonal dynamics that affect nutritional behavior.

Relevance for Clinical Practice

First, assessment and communication strategies must be tailored. Clinicians should proactively assess patients' dominant risk perception style—whether they respond better to objective data (eg., weight trends, lab values) or to tangible bodily changes—and tailor their communication accordingly. To bridge the gap in perceived severity, discussions must move beyond abstract warnings to explicitly link inadequate intake to concrete, feared outcomes such as treatment delays or specific surgical complications (eg., anastomotic leakage). Second, interventions should be designed to systematically amplify benefits and reduce barriers. The perceived benefits of "improved physical condition" can be leveraged by using a "nutrition-symptom diary" to help patients visualize the positive link between intake and daily function. Simultaneously, a multidisciplinary approach is needed to mitigate these barriers. For example, dietitians can provide personalized recipes to manage taste changes, social workers can address financial toxicity and access nutritional supplements, and psychologists can help alleviate the emotional burden and guilt associated with eating difficulties. Third, fostering self-efficacy is significant. Medical staff should coset small, achievable dietary goals with patients (eg., "try to take two more sips today than yesterday") to create mastery experiences. Acknowledging and celebrating these "small wins" is crucial for building confidence and breaking the cycle of helplessness. Finally, family caregivers should be formally trained and incorporated into nutrition care plans, and where feasible, structured peer support programs should be established. In the future, it is necessary to explore visualized, personalized, simple and easy-to-execute, and sustainable tracking patient dietary education and management systems to promote patients' dietary compliance behaviors.

Conclusion

Six categories and fifteen subcategories were identified. The research findings indicated that dietary compliance was by no means a simple matter of will but rather a dynamic decision-making process. The findings have direct and significant implications for multidisciplinary clinical practice. By systematically leveraging the HBM construct, healthcare teams can co-create a more supportive and effective nutritional care environment. This collaborative, theory-driven approach is essential for transforming dietary management from a passive recommendation into an active, sustainable patient behavior, ultimately optimizing treatment tolerance, surgical outcomes, and overall patient well-being.

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval

The program was granted approval by the Henan Cancer Hospital (2022-345).

Consent

This study obtained written informed consent from participants, reconfirmed by their oral consent prior to the interviews to have the interviews digitally recorded. In addition, participants informed consent included publication of anonymized responses/direct quotes.

Acknowledgments

We acknowledge all the patients who shared their experiences and the nurses in clinical units for their assistance.

Funding

This study was supported by the National Natural Science Foundation of China (Youth Program, Grant No. 82303925). This study was supported by Henan Province Medical Education Research Program (Grant No. WJLX2023008).

Disclosure

The authors declare no conflicts of interest in this work.

References

1. Bray F, Laversanne M, Sung H, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2024;74(3):229–263. doi:10.3322/caac.21834
2. Song C, Cao J, Zhang F, et al. Nutritional risk assessment by scored patient-generated subjective global assessment associated with demographic characteristics in 23,904 common malignant tumors patients. *Nutr Cancer*. 2019;71(1):50–60. doi:10.1080/01635581.2019.1566478
3. Ando N, Kato H, Igaki H, et al. A randomized trial comparing postoperative adjuvant chemotherapy with cisplatin and 5-fluorouracil versus preoperative chemotherapy for localized advanced squamous cell carcinoma of the thoracic esophagus (JCOG9907). *Ann Surg Oncol*. 2012;19 (1):68–74. doi:10.1245/s10434-011-2049-9
4. Ojima T, Nakamori M, Nakamura M, et al. Neoadjuvant chemotherapy with divided-dose docetaxel, cisplatin and fluorouracil for patients with squamous cell carcinoma of the esophagus. *Anticancer Res*. 2016;36(2):829–834.
5. Wang P, Zheng X, Luo Z, Wang Y, Guo Z, Zhou Y. Perceptions and experiences of nutritional management needs for patients with esophageal cancer during the peri-radiotherapy period: a qualitative study. *Asia Pac J Oncol Nurs*. 2022;9(4):202–209. doi:10.1016/j.apjon.2022.01.002
6. Abouarab AG, Mohsen AH, Mosellhy NE, Mousa MI, Abbas O, Manea H. Evaluating the impact of enteral nutrition vs parenteral nutrition on postoperative outcomes in esophageal cancer patients after esophagectomy: a systematic review and meta-analysis of randomized controlled trials. *Cureus*. 2025;17(9):e92413. doi:10.7759/cureus.92413
7. Li YF, Tao JH, Wang CC, Su DC. Perioperative nursing care strategies in esophageal cancer surgery: a mini-review. *Front Oncol*. 2025;15:1633887. doi:10.3389/fonc.2025.1633887
8. Wiseman MJ. Nutrition and cancer: prevention and survival. *Br J Nutr*. 2019;122(5):481–487. doi:10.1017/s0007114518002222
9. Skjærstein S, Åsaune KM, Fadnes LT, et al. Kostholdsveiledning hos fastlegen – hva rapporterer pasientene? [Dietary guidance from GPs - what do patients report?]. *Tidsskr nor Laegeforen*. 2024;144(4). doi:10.4045/tidsskr.23.0447
10. Amano K, Morita T, Koshimoto S, Uno T, Katayama H, Tatara R. Eating-related distress in advanced cancer patients with cachexia and family members: a survey in palliative and supportive care settings. *Support Care Cancer*. 2019;27(8):2869–2876. doi:10.1007/s00520-018-4590-6
11. Amano K, Morita T, Miura T, et al. Development and validation of questionnaires for eating-related distress among advanced cancer patients and families. *J Cachexia Sarcopenia Muscle*. 2023;14(1):310–325. doi:10.1002/jcsm.13133
12. Kufeldt J, Viehrig M, Schweikert D, Fritsche A, Bamberg M, Adolph M. Therapie der Mangelernährung verringert Komplikationsraten und Krankenhausverweildauern in einer radioonkologischen Universitätsklinik [Treatment of malnutrition decreases complication rates and shortens the length of hospital stays in a radiation oncology department]. *Strahlenther Onkol*. 2018;194(11):1049–1059. doi:10.1007/s00066-018-1360-9
13. Kohler LN, Garcia DO, Harris RB, Oren E, Roe DJ, Jacobs ET. Adherence to diet and physical activity cancer prevention guidelines and cancer outcomes: a systematic review. *Cancer Epidemiol Biomarkers Prev*. 2016;25(7):1018–1028. doi:10.1158/1055-9965.Epi-16-0121
14. Gibbs HD, Ellerbeck EF, Gajewski B, Zhang C, Sullivan DK. The nutrition literacy assessment instrument is a valid and reliable measure of nutrition literacy in adults with chronic disease. *J Nutr Educ Behav*. 2018;50(3):247–257.e1. doi:10.1016/j.jneb.2017.10.008
15. Çıtlık-sarıtaş S, Dural G. Effect of medication and dietary compliance on rehospitalization and the quality of life of patients with heart failure. *Florence Nightingale J Nurs*. 2020;28(2):184–193. doi:10.5152/fnjn.2020.19072
16. Zhang XP, Pan JH, Wan LH, et al. Factors influencing health behaviour, blood pressure control, and disability in hypertensive ischaemic stroke patients after a comprehensive reminder intervention. *J Adv Nurs*. 2020;76(6):1384–1393. doi:10.1111/jan.14340
17. Rosenstock IM, Strecher VJ, Becker MH. Social learning theory and the health belief model. *Health Educ Q*. 1988;15(2):175–183. doi:10.1177/109019818801500203
18. Karimi A, Kalantari S, Hamidi F, Taebi M, Heidari Gorji A, Malek Mohammadi E. Effect of education on nutritional knowledge of cancer prevention based on health belief model: a systematic review and meta-analysis. *Asian Pac J Cancer Prev*. 2025;26(1):33–41. doi:10.31557/apjcp.2025.26.1.33
19. Islam MT, Arafat SM, Chowdhury A, et al. Role of the health belief model in the management of hypertension: a systematic review. *Cureus*. 2025;17(10):e94139. doi:10.7759/cureus.94139
20. Cao Y, Han D, Zhou X, Han Y, Zhang Y, Li H. Effects of preoperative nutrition on postoperative outcomes in esophageal cancer: a systematic review and meta-analysis. *Dis Esophagus*. 2022;35(3). doi:10.1093/dote/doab028
21. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19(6):349–357. doi:10.1093/intqhc/mzm042
22. Saunders B, Sim J, Kingstone T, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant*. 2018;52(4):1893–1907. doi:10.1007/s11135-017-0574-8
23. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15(9):1277–1288. doi:10.1177/1049732305276687
24. Polit DF, Beck C. *Nursing Research: Generating and Assessing Evidence for Nursing Practice*. 10th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2016.
25. Carico RR Jr, Sheppard J, Thomas CB. Community pharmacists and communication in the time of COVID-19: applying the health belief model. *Res Social Adm Pharm*. 2021;17(1):1984–1987. doi:10.1016/j.sapharm.2020.03.017
26. Khalili N, Bahrami M, Ashouri E. Self-compassion and adherence to treatment in patients with cancer. *Iran J Nurs Midwifery Res*. 2021;26 (5):406–410. doi:10.4103/ijnmr.IJNMR_174_20

27. Melkamu L, Berhe R, Handebo S. Does patients' perception affect self-care practices? The perspective of health belief model. *Diabetes Metab Syndr Obes*. 2021;14:2145–2154. doi:10.2147/dmso.S306752
28. Papadopoulou A, Govina O, Tsatsou I, et al. Quality of life, distress, anxiety and depression of ambulatory cancer patients receiving chemotherapy. *Med Pharm Rep*. 2022;95(4):418–429. doi:10.15386/mpr-2458
29. Molfino A, Kaysen GA, Chertow GM, et al. Validating appetite assessment tools among patients receiving hemodialysis. *J Ren Nutr*. 2016;26 (2):103–110. doi:10.1053/j.jrn.2015.09.002
30. Scheufele P, Horner K, Corish C, et al. Comparison of appetite assessment methods in older adults from the APPETITE study. *Appetite*. 2025;208:107909. doi:10.1016/j.appet.2025.107909
31. Sun LL, Lai HZ, Chen ZZ, Zhu XS, Lin LZ. Modified Liujunzi decoction () alleviates chemotherapy-induced anorexia in advanced non-small cell lung cancer: a propensity score matched case-control study. *Chin J Integr Med*. 2020;26(4):256–262. doi:10.1007/s11655-020-3185-5
32. Song Y, Wang J, Liu H, Chen X, Zhan M. Diet and culture among Chinese patients undergoing hemodialysis: a qualitative study. *Front Nutr*. 2022;9:876179. doi:10.3389/fnut.2022.876179
33. Alamer AS. Behavior change theories and models within health belief model research: a five-decade holistic bibliometric analysis. *Cureus*. 2024;16 (6):e63143. doi:10.7759/cureus.63143
34. Lu Q, Dong L, Ihc W, You J, Huang J, Hu Y. The impact of an expressive writing intervention on quality of life among Chinese breast cancer patients undergoing chemotherapy. *Support Care Cancer*. 2019;27(1):165–173. doi:10.1007/s00520-018-4308-9
35. Forte P, Abate V, Bolognini I, et al. Mindfulness-based stress reduction in cancer patients: impact on overall survival, quality of life and risk factor. *Eur Rev Med Pharmacol Sci*. 2023;27(17):8190–8197. doi:10.26355/eurrev_202309_33579
36. Bourne MJ, Smeltzer SC, Kelly MM. Clinical teacher self-efficacy: a concept analysis. *Nurse Educ Pract*. 2021;52:103029. doi:10.1016/j.nepr.2021.103029
37. Parwati NM, Bakta IM, Januraga PP, Wirawan IMA. A health belief model-based motivational interviewing for medication adherence and treatment success in pulmonary tuberculosis patients. *Int J Environ Res Public Health*. 2021;18(24):13238. doi:10.3390/ijerph182413238
38. Mu D, Jinli X, Li X, et al. Clinical nutrition service capacity of 445 secondary or above hospitals in Sichuan, China: the 2021 annual survey. *Asia Pac J Clin Nutr*. 2023;32(2):215–226. doi:10.6133/apjcn.202306_32(2).0004
39. Lambert K, Mansfield K, Mullan J. Qualitative exploration of the experiences of renal dietitians and how they help patients with end stage kidney disease to understand the renal diet. *Nutr Diet*. 2019;76(2):126–134. doi:10.1111/1747-0080.12443
40. Yang L, Li K, Liang Y, Zhao Q, Cui D, Zhu X. Mediating role diet self-efficacy plays in the relationship between social support and diet self-management for patients with type 2 diabetes. *Arch Public Health*. 2021;79(1):14. doi:10.1186/s13690-021-00533-3
41. Sousa H, Ribeiro O, Paúl C, et al. "Together we stand": a pilot study exploring the feasibility, acceptability, and preliminary effects of a family-based psychoeducational intervention for patients on hemodialysis and their family caregivers. *Healthcare*. 2021;9(11):1585. doi:10.3390/healthcare9111585
42. Toija A, Kettunen T, Kasila K. Multidimensional peer support in health care: breast cancer patients' perspectives on interaction with peer supporters. *Eur J Oncol Nurs*. 2025;78:102971. doi:10.1016/j.ejon.2025.102971